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Gated Neighborhoods, Privatized Amenities and Fragmented Society: Evidence from Residential Experience and Implications for Urban Planning

Yu Wang [1,*], David Shaw [2] and Ke Yuan [3]

[1] Urban Studies, School of Social and Political Sciences, University of Glasgow, Glasgow G12 8RS, UK
[2] Geography and Planning, School of Environmental Sciences, University of Liverpool, Liverpool L69 7ZT, UK; David.Shaw@liverpool.ac.uk
[3] Institute of Education and Economy Research, The University of International Business and Economics, Beijing 100029, China; yu_anke@126.com
* Correspondence: yu.wang@glasgow.ac.uk; Tel.: +44-(0)141-3308-653

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Abstract: Nowadays, urban space has become more fragmented and largely consists of many unconnected enclaves. The significance of neighborhood amenities to resident's quality of life has been identified in the recent literature. However, studies have inadequately explored the real experience of residents in their use of neighborhood amenities under the gated urban form. Since the 1990s the urban environment of many Chinese cities has been re-shaped by the large creation of gated neighborhoods. Based on a case study in the city of Shenzhen, this paper draws upon evidence of residential satisfaction with local amenities to reveal a significant variation between different neighborhoods. The outcome of the enlarged social differentiation is a result of imbalanced micro-level urban development. The findings also provide new evidence demonstrating the increased fragmentation of society as the consequence of urban privatization. By linking the planning process with the social outcome, this paper reflects on the current strengths and weaknesses of the Chinese urban planning system.

Keywords: neighborhood amenity; urban privatisation; socio-spatial nexus; residential satisfaction; gated neighborhood

1. Introduction

The expansion of gated urban environments is a rising phenomenon in both the developed and developing world [1]. After initial widespread development in North America [2,3], gated neighborhood grows in popularity in Latin America, Eastern Europe [4–6], East and Southeast Asia [7]. As a globalized urban product that has been commonly observed by worldwide scholars [8,9], gated communities appear with widespread embodiments such as 'sealed residential quarter', 'walled feature' and 'enclosed management'. There are different voices discussing the social consequences of gated community. Some suggest that this primarily serves as a security function with residents welcoming this form of development because it produces a safe and decent environment [10]. This is particularly evident in cities like Johannesburg and Cape Town in South Africa where walled communities are a typical outcome of the server racial segregation. The gated environment, which is often the result of the privatization of urban space, has both positive and negative social consequences [6]. As gates and walls become more readily acceptable throughout the world, Li et al. [11] (p. 253) have indicated that 'gating in, and of itself, is not a major factor' affecting resident's neighborhood attachment to a place. Breitung [12] found that some residents had a strong desire to

separate 'insiders' from 'outsiders'. In many American cities, whilst a gated community provides a safe living environment [13], they also, create new battles between members and non-members over the use of space and conflicts between members over community management [14]. Some studies indicate gated communities can produce social problems, increase disengagement and jeopardize any sense of a cohesive neighborhood [15,16]. Moreover at the city scale, Madanipour [17] suggests urban space now has often been fragmented into unequal parts, reflecting broad existence of social stratification. Gated communities thus may blur the boundaries between public and private realms, increase tensions on urban accessibility and livability [18] and leads to social inequalities and polarization [5]. In Latin American cities such as Rio de Janeiro and Buenos Aires [19,20] and Southeast Asian cities such as Kuala Lumpur and Ho Chi Minh [21,22], gated communities have all largely replaced public accessibility by privacy and exclusivity. However, whether urban residents can still enjoy relatively easy and equitable access to urban opportunities and civil service are often questionable and has become a new challenge for their urban management systems.

Enormous socio-spatial changes have occurred in China following its recent urban transformation processes. People who used to be organized by the old 'work units' have now been reorganized by the market economy and relocated into self-selected geographic neighborhoods [23]. Nevertheless, unique neighborhood spaces have emerged because of the privatized development under a collective land policy. For a gated neighborhood, public facilities and communal space are shared goods by all the residents who live inside. However, there is little research concerning the increasing inequality regarding users experience with amenities in gated neighborhoods, which are developed in a more fragmented spatial form and segregated social environment [24]. The socio-spatial consequences of this transformation need further exploration. Moreover, treated simply as private housing issues to be resolved between the developers and residents, most gated spaces are often far from the attention of public policies. The apparent lack of concern in understanding this from a planning policy perspective may have enabled private urban developments that have become a significant component of recent urban transformation to adjust the way of delivering urban service. The gated neighborhood pattern, which increasingly leads to more privatization of urban space and urban amenities, is proving a great challenge to the way that Chinese planners and developers have traditionally built and managed the urban environment. The current planning and governance systems, which focus on the publically provided urban resources and locally accessible community services, have paid little attention to the 'more privatized' inner space of neighborhoods, as the provision of internal amenities is not within the core concerns of the planning system. Focusing on the Chinese gated environment, this paper addresses this omission by exploring the disparity of neighborhood-level services and amenities based on the real reflection of residents and users. This paper is organized in four parts. The next section provides a literature view of key relevant concepts, especially the residential satisfaction and neighborhood amenities. We then introduce an empirical study in city Shenzhen along with a justification of case selection and the research methods used. The analytical part focuses on the assessment outcome of residential satisfaction with neighborhood amenities and its links with the physical environment. The section of discussions and conclusion is a summary of the typical socio-spatial nexus and the current weaknesses of the Chinese planning system. We contribute to the general literature by including new evidence on the socio-spatial consequences of urban privatization.

2. Literature Review

2.1. Urban Transformation in China: Marketized Housing and Fragmented Space

Gated neighbourhoods largely occur as the result of housing marketisation in many post-socialist cities, where residential development has become a product of private sector instead of state welfare after the profound reforms [5]. Following China's recent urbanization explosion, the fortification of new neighborhoods that have become gated, or enclosed in character, has largely replaced the old open-ended work units and collective housing. A new kind of urban landscape has been

reshaped with the operational of a new market economy and the reform of housing system, in which private developers, commodity housing and gated neighborhoods have dominated the recent urban development [23]. Private developers often supply the local collective goods instead of the input from the local government. The inhabitants who share the consumption of specific goods under this type of ownership arrangement pay the respective fees to the service and maintenance on their property and collective goods. However, recent studies in China have not paid much attention to the impacts of the gated neighborhoods on the wider integration of spatial resources and public services, and the connectivity to the overall livability of residents [25,26]. Whilst in the past the development of neighborhood environment and provision of facilities and functional services were undertaken by the state, now they are much more dependent on developers and agencies under market-orientations [27,28]. Yet the social aspect of the gated neighborhoods within Chinese cities has been rarely discussed, neither in terms of residential satisfaction with neighborhood facilities, nor in terms of where responsibility for providing services (the public or the private sector) should lie.

2.2. The Changing Provision for Neighborhood Amenities

The privatisation of public goods is unavoidable in urban transformation process in many post-socialist countries like China. As can be seen from the cases of Sofia [16] and Budapest [5,29], the boom of gated communities in post-socialist countries, often driven by real estate developers and foreign capital, has weakened the power of public authority in managing urban space. Private developers often supply the local collective goods instead of the input from the local government. Furthermore, Glasze [9] suggests local governments could also profit from private neighborhoods being established within their boundaries as these developments are often self-financing. In the Chinese context, this largely benefits the local government by saving the cost of building and maintaining necessary facilities for the massively developed neighborhoods. However, as suggested by many western researchers [9,18,30], the private sector often fails to provide collective goods for clubs, such as green spaces and recreational facilities. It is important for the public sector to step in when these goods are not sufficiently provided by the private sector [9]. For new developments completed in a rapid urban transformation process, many developers have pursued short-term agendas of maximizing their financial returns rather than providing decent living environments taking into account residents' real needs.

The inclusion of urban amenities may vary with individual and household circumstances. Duncan et al. [31] listed five critical categories of amenity provision: educational, retail, food, recreational and entertainment by the different types of individual activities. Amenity provision can also be classified from the perspectives of both the nature and management of the service, which can include government, business and non-profit services, at least according to Sirgy et al. [32]. Paralleling this Western emphasis, supportive amenities in China also include schools, shops, restaurants as well as health and medical centers, sports and fitness venues, which are all related to a resident's daily needs. Traditionally, the provision of these amenities in new development projects had long been the responsibility of the Chinese national planning system, with their design and construction being prescribed through various planning and design guidelines [33,34]. Certain types of public facilities are required by the national regulations, such as educational, health, commercial, cultural and sporting facilities. From an individual perspective, the availability of space and facilities within the immediate vicinity are important for residents. Regulations for the development of Chinese neighborhoods also encourage spatial mixed-use and with adequate facilities being reasonably accessible. Many studies show that leisure and exercise opportunities that can take place inside neighborhoods are essential [35,36], as they provide a wide variety of recreational experiences with the expectation of enjoyment and personal satisfaction. Residents satisfaction with green space, sports facilities and playgrounds are thus vital [37]. With the rapid growth of car ownership among urban citizens, accessibility to suitable car parking spaces has also becom increasingly important. From an individual perspective, access to car parking within or adjacent to neighborhoods should

also be included as one component of residential satisfaction. Services such as higher education and employment are excluded from the study's focus because in the Chinese context they are not specific needs of residents at the scale of neighborhood. They might be suitable considerations with regards higher-level urban planning contexts, for example, specific large public facilities plan, which normally operates at the municipal and district levels.

2.3. The Restricted Planning System

As argued by Abramson [38], urban planning system in every country are usually constrained by their existing institutions and values, and thus may not always be sufficiently flexible to respond to new societal challenges. So it is with China, whose planning system seems to be rigid despite recent great spatial and social change. The Chinese system is recognized as having focused on enabling economic growth with great emphasis being placed on making functional, regulatory and detailed plans, but is lacking in terms of its analytical, communicative, and advocacy roles [38,39]. Hence, sustainable development at the local level 'is not fully recognized' neither have 'planners . . . been entrusted with a role as facilitators among stakeholders' [40] (p. iv). The urban planning system has also been largely influenced by the popular marketisation of housing development and privatization of public space and facilities. There are changes in way that the local neighborhood amenities are being provided in this vast urban transformation. Nowadays, the availability, management and maintenance of neighborhood is becoming increasingly variable, as the dominated type of neighborhood in China has become a 'gated' one with clear boundaries separating one from another. Increasingly, certain types of facilities, especially the recreational facilities such as sports playgrounds, public spaces as well as car parking spaces, that were externally provided by the state, are becoming internal assets of neighborhoods within a dominant gated form. However, the changing provision and access to communal facilities has not attracted enough attention from urban planners in China. Many of these shared amenities are not planned at the beginning of neighborhood development process but have evolved synchronously with the growing residential demands. Because the typical enclosed pattern transforms public service into private products that is beyond the current planning scope in China, the quality of the inner environment of neighborhood may greatly differ and is highly influenced by individual developers and their preferred development patterns [41]. The rising differentiations in the quality of space inside a neighborhood also relates to the current planning regulations. The provisions of schools, health care centers have predetermined control index that must be satisfied and delivered as part of the local planning, authorisation and development process. By contrast, although encouraged by planning guidelines, the provision of public spaces within a neighborhood does not enjoy the same mandatory status in either its location or area/volume of development. This is partly because of the split in responsibilities between a state-led planning and a more market-orientated development [42]. Government planners are responsible for large public facilities at district level and block level that usually covers tens of thousands of households. However, it is developers, and their appointed designers, that determine the size and location of green and public spaces, and affiliated facilities such as sports playgrounds for each neighborhood development. The numbers of parking spaces included inside neighborhood developments can also vary widely, because it is not intentionally regulated by the planning system. Thus, the inner setting of Chinese gated neighborhoods is shaped in many diversified ways involving detailed negotiations between public planners and private developers. As a result, discrepancies exist in the new and different forms of gated space and the changing modes of service provision, potentially lead to varied residential experiences with neighborhood amenities associated with inequalities between gated neighborhoods.

3. Assessing Neighborhood Environment

3.1. Subjective Assessment and Residential Satisfaction

Two broad approaches have been developed in investigating the quality of residential space: objective and subjective assessments [43–46]. Objective assessment often focuses on the physical condition and environmental attributes of a neighborhood, such as density, distance to transportation systems and coverage of green space. Some researchers have also included socio-economic factors of a neighborhood into the objective assessment framework, such as housing price, family size and rental status [47]. In contrast, the subjective approach is to explore the life experiences and levels of residential satisfactions in particular neighborhoods [48]. Indeed, quality of space can only be understood as a phenomenon if it is able to reflect the real opinions of its occupants [49]. Subjective indicators, as argued by Hur, et al. [50], are thus more meaningful by providing perceived attributes that are directly received from residents. Some [51] even argue that subjective perceptions should carry more weight in discussing the quality of space than objective environmental characteristics. In this study, we focus on the subjective approach by using the experiences of residents who live in urban neighborhoods. This is because the social aspects of planning, in which people's real attitudes towards their living environment should be reflected, is currently a significant gap in Chinese literature of this phenomenon [52]. It is suggested that planners, who have paid great attention to the objective controlling indices for urban development projects, have largely ignored feedback from residents, who are real occupants of the space [53].

Current literature has some varied compositions regarding the topic of subjective residential satisfaction. Davis and Fine-Davis [54] and Chapman and Lombard [55] largely focused on two crucial components of satisfaction based on individual-household characteristics and neighborhood-level characteristics. Gan et al. [56] developed a more complicated, four-layered structure that covered housing unit, neighborhood environment, estate management and social environment. We have located this study into the contemporary theories of residential satisfaction but narrowed our scope to a particular discussion of the subjective satisfaction with amenities. This is established in our study as one of the three distinct but interconnected components of residential satisfaction (Figure 1). Satisfaction with individual housing includes housing quality, such as floor space, housing structure and building features meanwhile satisfaction with social environment explores the interactions between neighbors, the levels of cohesion and sense of belonging to a neighborhood. The focus of this paper, satisfaction with neighborhood amenities, includes the resident's experiences with the public facilities and communal space that are collectively shared by all residents. In the existing literature of residential satisfaction, good access to various local services and facilities are suggested to be at the core of significantly influencing an individual's quality of life [57,58]. Though residential satisfaction may vary individually, many general features of a neighborhood, including whether it fails to satisfy the needs of residents, can be clearly identified in social research [26,57].

3.2. Assessing Neighborhood Amenities

The demands from inhabitants on the urban environment includes a fundamental expectation to have access to certain amenities. Residents often express great importance on the significant benefits from amenity improvement, which is not only related to their desire for improving their own quality of life but also an expectation of the potential rise in their property values, as widely discussed by researchers based on hedonic price models [59,60]. By providing services to meet the basic needs of residents, promoting social interaction and enhancing the overall quality of life, amenities are clearly vital in building sustainable neighborhoods [61]. Amenities not only meet the basic leisure needs of residents but also contribute to providing civic connections and inspiring social activities [62] and shape local pride as 'brand and identity' for residents and build stability and reputation for the neighborhood [63,64]. The subjective satisfaction with amenities, however, may be affected by both quantity and quality of amenities. Quantitative factors often include distance and sufficiency and

can often be tangibly measured. For example, studies [65,66] suggest the important role of distance: Neighborhood service provision should take a spatial reference, normally within 600 m to 800 m (a 15-min walk), which is often regarded by residents as an appropriate neighborhood buffer size. The quantity issue, or the sufficiency of provision, is often related to the extent of development, which are more tangible and can be largely improved through planning practices. Comparing with quantity factors that can be easily and tangibly measured, qualitative factors are often fuzzy and complicated. The quality of service and maintenance of facilities can undoubtedly affect the user experience. For measurement, scholars often interpreted these factors from user's perspective, such as leisure time and costs for use [55,67]. Besser et al. [64] suggest functional diversity that can bring in a variety of activities could affect user's satisfaction, for instance in the sporting type whether swimming pools and tennis courts is included or not can make a difference. Another important issue that has often been neglected in the current literature is the equal rights to access public facilities. This requires a more balanced distribution of facilities across urban space and among population groups. However, this is being greatly challenged because of the increased spatial fragmentation and social segregation with the development of urban neighborhoods [31,68]. As Munro [69] has argued, the equitable provision of amenities has been identified, locally and internationally, as an important component of sustainable development. In summary, urban development policies should more explicitly consider the social requirements of residents to have more equal access to facilities that should be more sufficiently planned and effectively managed. The paper now turns to empirical studies to support the above theoretical arguments.

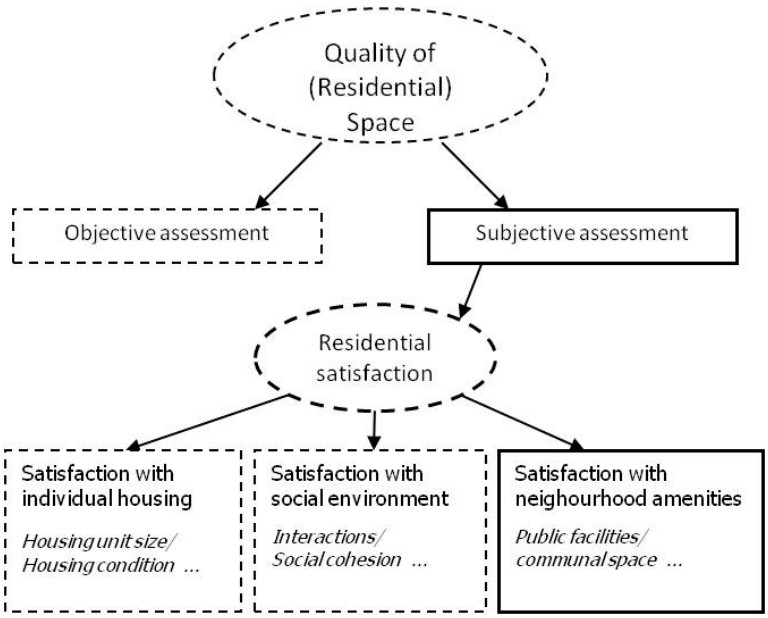

Figure 1. A conceptual framework of the study and links to existing theories.

4. Research Methods

4.1. Case Study in Gated Neighborhoods in Shenzhen

Our empirical study was undertaken in the city of Shenzhen, a mega-city in South China with a 1997 km^2 urban area and over 10 million population, to explore the provision of local amenities with neighborhood development and resident's subjective satisfaction with these amenities. Rapid urbanization, since the 1980s, has enabled an enormous increase in Shenzhen's urban population and this has been accompanied by the creation of a vast number of urban neighborhoods. Detailed case studies were undertaken in the Houhai-Dengliang area near the border between mainland China and Hong Kong (Figure 2). The Nanshan District where Houhai-Dengliang (HD) is located is a core

developed residential area in Shenzhen. In the City Master Plan of 2010, this area was re-affirmed as having a core residential function with potential for expansion on the east side of Shenzhen Bay on new land reclamation projects [70]. It has become one of the most well-established living places after many years of development.

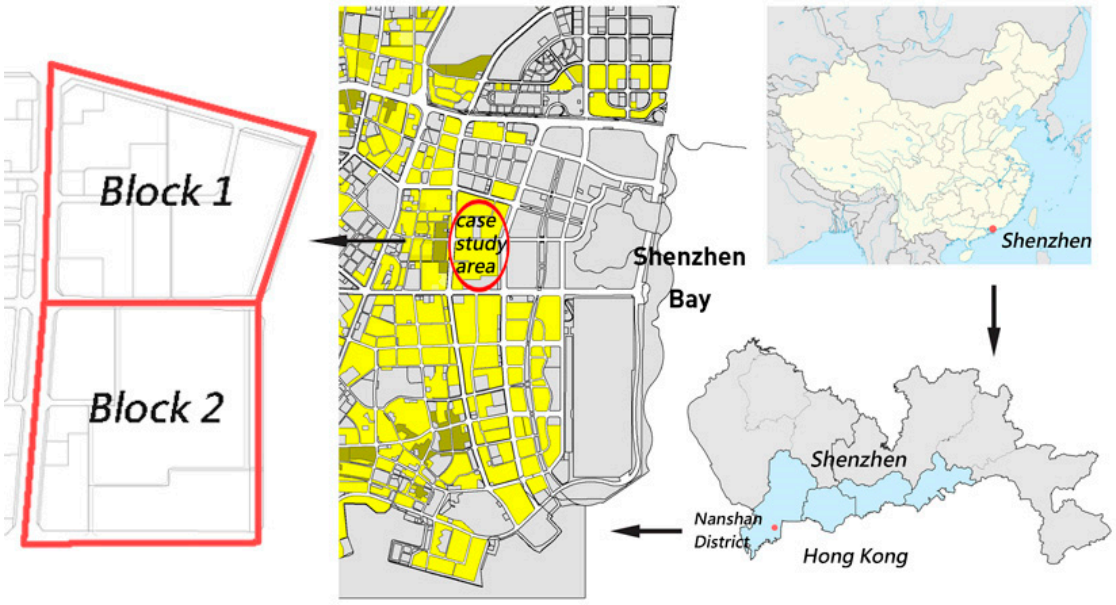

Figure 2. The location of the case study area and the boundaries of the two urban blocks.

As the hypothesis is to examine the impact of gated and fragmented urban form on urban amenity provision, the selection of cases has to limit the potential impacts from non-form variables. Significantly varied locations, road connectivity and surrounding environments may also cause very different social outcomes [61,71,72]. We observed potential factors in advance, which including external factors such as location, transport accessibility and local planning procedure. In this area, they were judged as similar for all neighborhoods, which provides the rationality of the case study to mainly investigate urban form's influence on neighborhood amenity.

In the study area of HD, different neighborhoods are distributed within two large blocks on both sides of Dengliang Road. They are all within easy walking distance from the metro station (Figure 3). Access to local public transport system for each neighborhood is similar. By the end of 2013, the whole case study area covered about 45.6 hectares and was home to 7887 households. The spatial distributions of the substantive nearby amenities in this area are shown in Figure 3. Another merit of this area is from its clear spatial structure, which is easy to analyze as there are no disturbances from business, manufacturing or other types of land use. It is exclusively a residential area consisting of two blocks that are mostly symmetrical in character. Moreover, how the local planning works is also considered as a factor. Shenzhen's local planning system is characteristic of the planning system across China. The lowest level regulatory plans control the form and structure of urban development and also guide and regulate the provision of neighborhood facilities in practice. In this study area, local planning policies, and regulations for amenity provision, are constant and applied by a single planning unit. Hence, there should be no influence from varied regulations, insistent policies or planning changes in the provision of neighborhood amenities. In summary, the study area is a typical case to explore the variation of residential satisfaction across different gated neighborhoods.

Figure 3. The spatial distributions of neighborhood amenities within the study area.

Many typical neighborhood forms in Shenzhen can be found in this area, in terms of scale and density, which is also an important justification for case selection. Within the two blocks, a number of distinctive neighborhoods with a variety of different forms are evident. These forms are characteristic of the whole city's recent urban neighborhood development [73] and can be categorized based on the combination of the scale and density of development. The local planning regulation controls site scale (in hectare) as the size of development site and plot ratio is a calculation of density, from both a horizontal and vertical perspective (Table 1). Across the city as a whole, and within the study area in

particular, five distinct neighborhood types are evident in the study area: large-scale medium-density (LSMD), medium-scale low-density (MSLD), medium-scale medium-density (MSMD), medium-scale high-density (MSHD), and small-scale high-density (SSHD).

Table 1. Neighborhood patterns classified by the scale and density of development.

Group	Site Scale (ha)	Density (Plot Ratio)	Proportion in the City
LSMD (large-scale medium-density)	>5	1.9–3.5	4.79%
MSMD (medium-scale medium-density)	1–5	1.9–3.5	39.65%
MSLD (medium-scale low-density)	1–5	<1.9	10.35%
MSHD (medium-scale high-density)	1–5	>3.5	8.29%
HHSD (small-scale high-density)	<1	>3.5	10.78%

Note: The proportion is calculated based on the number of neighborhood patterns across the city by year 2010.

4.2. Survey Design

A questionnaire survey was designed to evaluate from a resident's perspective and was conducted in 2013 in Shenzhen. The questionnaire clearly specified that the participants should focus on how they evaluated the sufficiency of their current nearby amenities regarding their real needs and demands. Quality of these facilities were not assessed in this survey. Respondents were asked to indicate how satisfied they were with the sufficiency of the designated amenities within the study area using a five-point Likert scale [74] from extremely unsatisfied (1) to extremely satisfied (5). The key required neighborhood amenities, according to national and local planning regulations include educational facilities, health facilities, commercial facilities, welfare facilities, cultural facilities, playgrounds and sports facilities, neighborhood public space, green space and parking spaces. As a result, the satisfaction with the nine types of amenities were examined in the questionnaire survey (See Table 2).

Table 2. The nine types of amenities examined in the questionnaire survey and abbreviations.

	Type of Amenities	Abbr.
1	satisfaction with educational facilities	(SF_ED)
2	satisfaction with healthy facilities	(SF_HE)
3	satisfaction with commercial facilities	(SF_CM)
4	satisfaction with welfare facilities	(SF_WE)
5	satisfaction with cultural facilities	(SF_CL)
6	satisfaction with sports facilities	(SF_SP)
7	satisfaction with public space	(SF_PS)
8	satisfaction with green space	(SF_GS)
9	satisfaction with parking spaces	(SF_PK)

A spatially stratified random sampling method was adopted in the survey. The sample size for each neighborhood was predetermined based on neighborhood type and location, approached from neighborhood to household and then the individual in three stages. Samples were pre-arranged and divided into different neighborhoods. In each neighborhood (consisting one or more buildings) a random sampling method was applied to households. Within each household the decision as to which individual should be responsible for answering the questionnaire was left to the householders themselves, but each respondent need to be over eighteen years old. All potential participants were informed of the purpose of the survey, were guaranteed anonymity and gave their informed consent to participate. In total, across the five neighborhood types, 226 valid survey responses were completed, with an overall response rate of 59.5%. The sample size to the total number of households in this area is about 1%. The general demographical features of respondents are shown in Table 3. Onsite observations were also conducted to evaluate the physical attributes of neighborhood amenities, which enabled their actual number, type and distribution to be recorded.

Table 3. Demographic features of participants.

Demographic Variable	Category	N	Percent
Gender	Male	108	47.8
	Female	118	52.2
Age	18–25	4	1.8
	26–35	46	20.4
	36–45	91	40.3
	46–55	37	16.4
	56 or above	48	21.2
Household Member(s)	1	9	4
	2	31	13.7
	3	95	42
	4	40	17.7
	5	44	19.5
	>5	7	3.1
Education	Primary school or less	1	0.4
	Middle School	13	5.8
	High school	50	22.1
	College	65	28.8
	University	76	33.6
	Master or above	21	9.3
Individual monthly income (Currency CNY)	Low (below 3000)	39	17.3
	Medium-low (3000–5999)	67	29.6
	Medium (6000–9999)	37	16.4
	Medium-high (10,000–14,999)	42	18.6
	High (15,000–19,999)	26	11.5
	Elite (20,000 or above)	15	6.6

5. Results

Our analysis aims to explore variations in the residential satisfaction regarding the sufficiency of neighborhood amenities within different types of gated neighborhoods. In this section, findings from our analysis of survey results are presented and discussed, initially at a general block level, before focusing on similarities and differences between neighborhoods. Particular themes and issues that emerge from the results are highlighted.

5.1. Overview of the Results

When examining the results for the whole area, or at the level of the two blocks, the level of residential satisfaction with the overall provision of amenities and facilities is relatively strong and positive. Across the entire research area satisfaction is generally positive for seven of the nine amenities (Table 4). Furthermore, between the two blocks of residential development there is little variation in satisfaction in amenity provision (Table 5). The independent T-test suggests that eight indicators out of nine are non-significant ($p > 0.05$); the only one difference lies in the public space (T = 2.261, $p = 0.025$).

Table 4. The overall subjective satisfactions with different types of amenities.

	SF_ED	SF_HE	SF_CM	SF_WE	SF_CL	SF_SP	SF_PS	SF_GS	SF_PK
Mean	4.01	3.66	4.07	2.85	3.4	3.08	3.32	3.46	2.56
Std. Deviation	0.808	0.905	0.899	1.032	1.003	1.221	1.183	1.144	1.142

Table 5. T-test results comparing the levels of subjective satisfaction between the two urban blocks in this area.

	SF_ED	SF_HE	SF_CM	SF_WE	SF_CL	SF_SP	SF_PS	SF_GS	SF_PK
Mean Block 1	4.02	3.66	4.06	2.81	3.46	3.04	3.19	3.36	2.53
Mean Block 2	4	3.66	4.07	2.9	3.3	3.16	3.54	3.64	2.61
t	−0.188	−0.013	0.075	0.648	−1.159	0.680	2.261	1.750	0.526
Sig. (2-tailed)	0.851	0.989	0.940	0.517	0.248	0.497	0.025	0.081	0.600

However, if the analysis focuses on the level of the neighborhood then significant variation exists in residential satisfaction with amenities (see Table 6 and Figure 4). An ANOVA test result

indicates that there is no significant variance in the satisfactions with educational, health, commercial and cultural facilities ($p > 0.05$), which, as discussed above, have all received a positive mean score. By contrast, with welfare facilities, sports facilities, public space, green space and parking spaces, then significantly lower satisfaction scores in small-scale high-density (SSHD) neighborhoods are reported when compared with large-scale medium-density (LSMD) and medium-scale medium-density (MSMD) neighborhoods ($p < 0.05$). The differences are significant at the 95% confidence levels. Hence, residents in different types of neighborhood, albeit in the same area, have significantly differences in their residential experiences. This disparity requires a further investigation into how the current planning process actually works and where the potential problems in the provision of amenities actually arise.

Table 6. Residential satisfaction with different types of facilities among different patterns of neighborhood.

Neighbourhood Pattern	SF_ED	SF_HE	SF_CM	SF_WE	SF_CL	SF_SP	SF_PS	SF_GS	SF_PK
LSMD	3.9	3.73	4.11	3.06	3.59	3.51	4.05	4.04	2.7
MSHD	4.04	3.71	4.02	2.67	3.23	2.79	3.15	3.15	2.98
MSMD	4.22	3.69	4.06	3.08	3.5	3.25	3.75	3.89	2.61
MSLD	4.07	3.63	4.2	2.73	3.37	2.7	2.27	2.73	2.2
SSHD	3.97	3.44	3.91	2.41	3.13	2.63	2.25	2.72	1.88
Std. Deviation	0.808	0.905	0.899	1.032	1.003	1.221	1.183	1.144	1.142
Sig. of ANOVA *	0.373	0.638	0.736	0.010	0.136	0.000	0.000	0.000	0.000

Note: ANOVA tests analyzed the variations between the five neighbourhood patterns.

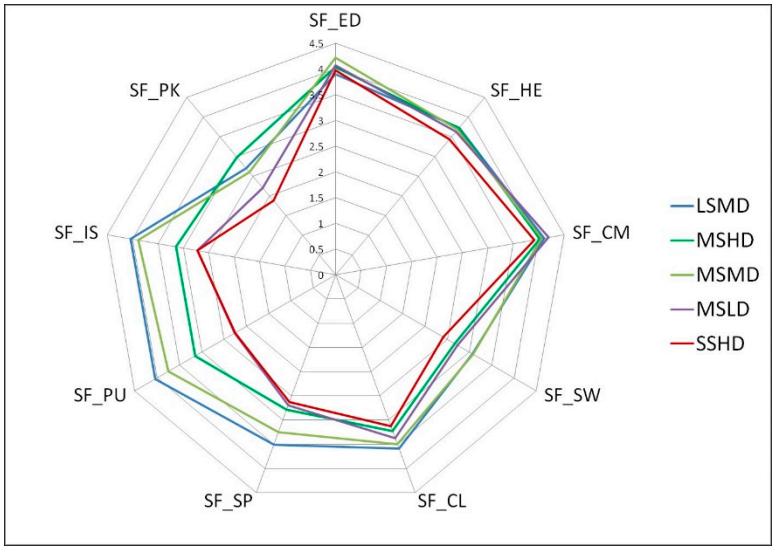

Figure 4. The visualized outcome of residential satisfaction with neighborhood facilities.

It may be assumed that subjective residential satisfaction could be caused by social-demographic factors. For instance, higher-income residents may be expected to have higher expectations on the quantity of amenities and may intend to be less satisfied comparing with lower income groups. However, this hypothesis was rejected by this study, which suggested that there was a weak association between the demographic characteristics and the satisfaction with neighborhood amenities. As can be seen in Table 7, only a weak, negative association existed between the length of residency and the satisfaction with public space and green space. Inhabitants with a longer period of residence within a neighborhood would be slightly more dissatisfied, but the reasons for this are unclear. Overall, it does not appear to be the social demographic characteristics of the residents that affect their satisfaction with neighborhood amenities but rather the spatial characteristics of the neighborhood within which they live. This again consolidates our research hypothesis generated from a theoretical debate on the differentiated society as the result of the fragmented urban space.

Table 7. Spearman's Correlation: Socio-demographic features and subjective satisfaction results.

	Spearman's	SP_ED	SP_HE	SP_CM	SP_WE	SP_CL	SP_SP	SP_PS	SP_GS	SP-PK
Age	Correlation Coefficient	−0.008	0.038	−0.024	0.007	0.031	−0.008	−0.100	−0.091	0.126
	Sig. (2-tailed)	0.907	0.571	0.719	0.913	0.642	0.903	0.133	0.174	0.059
Household Member	Correlation Coefficient	−0.071	0.096	0.030	0.137 *	0.028	0.046	0.001	0.040	0.154 *
	Sig. (2-tailed)	0.285	0.148	0.650	0.040	0.676	0.491	0.985	0.548	0.021
Income	Correlation Coefficient	−0.011	0.092	0.074	0.081	0.000	0.083	0.077	−0.039	−0.085
	Sig. (2-tailed)	0.875	0.170	0.270	0.227	0.999	0.213	0.248	0.558	0.202
Length of Residence	Correlation Coefficient	0.091	−0.021	0.007	−0.102	0.043	−0.084	−0.190 **	−0.185 **	−0.097
	Sig. (2-tailed)	0.178	0.759	0.916	0.130	0.522	0.215	0.005	0.006	0.153
Education Background	Correlation Coefficient	0.008	−0.001	0.128	−0.033	0.016	−0.077	0.014	−0.002	−0.141 *
	Sig. (2-tailed)	0.907	0.987	0.056	0.620	0.807	0.248	0.834	0.978	0.034

Note: ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

5.2. Linkages between Social Outcome and Spatial Inputs

A spatial-social comparison was made to link the social outcomes described above with the related planning inputs. Details of the number and type of each amenities were surveyed during onsite visits and are listed in Table 8. According to the local planning regulations, many of the existing core public amenities are mandatorily planned and delivered taking the urban block as a whole. Guiding indices (see Table 9 as an example) details the types of amenities required and suggests the space that needs to be allocated during the planning and development of local neighborhoods. For instance, there is a strong emphasis in planning with the provision of educational facilities [75], including both a large built-up area and an independent site with pubic accessibility (Kindergarten is exempted from the independence requirement, UPLRC, 2013). This and other core facilities have been emphasized for a long time as being important aspects of Chinese urban planning [76], often following Perry's 'neighborhood unit' concept [77]. Similarly, health services, such as branch hospitals, pharmacy stores and clinics, are equally planned and shared within the entire Houhai-Dengliang area. Cultural facilities, which usually include neighborhood cultural centers and skill training agencies are also in a centralized provision. Commercial space is encouraged to be attached to neighborhoods by the local planning system [78], often with numerous small shops and markets using the frontage ground floor of a neighborhood development. Therefore, most residents can usually access such facilities within a walkable radius from where they live. This has often been described as the effective implementation of a mixed-use planning policy [78,79]. Indeed, the overall satisfaction with these shared, educational, health, commercial and cultural facilities are similar within all the neighborhoods and within the two blocks.

Table 8. The onsite observation results for each type of local amenities within the study area.

Type of Amenities	Sub-Group	Number	Access	Sector
Education	High and middle school Primary school	1 4	Open to the public	Public Sector
Health	Community clinics (called as hospital branches) Pharmacies	2 14	Open to the public	Public Sector
Commerce	Supermarkets Continence stores Food/restaurants	3 >35 >30	Open to the public	Public Sector
Culture	Cultural centers Skill training agencies	2 6	Open to the public	Public Sector
Social welfare	Social assistance service included in community service centers	2	Open to the public	Public Sector
	Elderly care service included in resident's activity centers	0–1 (varied in each neighbourhood)	Shared by insiders	Private Sector
Sports	Playgrounds with fitting equipment Gyms	1–10 (varied) 0-2 (varied)	Shared by insiders Shared by insiders *	Private Sector Private Sector
Public space (collective)	Well-designed small squares or recreational spaces	1–8 (varied)	Shared by insiders	Private Sector
Green space (collective)	Open spaces with greening or purposely designed landscapes	1–12 (varied)	Shared by insiders	Private Sector
Parking spaces	Internal small car parks on the ground or under the ground Other random spaces	Capacity varied between 60–1400	Shared by insiders	Private Sector

* Note: In some neighborhoods, gyms could be semi-public when fees are charged.

Table 9. Shenzhen's local planning regulation for certain types of amenities, all indices comply with 20,000 capita.

Type of Facility	ED *			HE	CM	CL	SP	WE
	ED1 (MH)	ED2 (PR)	ED3 (KG)					
Minimum built up area (m^2)	14,850	6500	6400	400	500	300	-	300
Minimum plot area (m^2)	25,200	8700	7200	-	-	-	3000	-

* Note ED1 (MH): middle schools and high schools; ED2(PR): primary schools; ED3 (KG) refers to kindergartens; HE: healthy facilities; CM: commercial facilities; CL: cultural facilities; SP: sports facilities; WE: welfare facilities. The requirement on welfare facility is indicated 'only a reference for mature urban areas, but not compulsory' [80].

However, across all the neighborhoods there are deficiencies in the overall provision of welfare facilities and the general negative level of dissatisfaction reported tended to confirm this assessment. Such facilities provide social assistance to more disadvantaged social groups, such as the elder, disabled and vulnerable people, but has only recently been added as public facility that should be designed into local neighborhood development [80]. Whilst larger scale provision, noticeably nursing homes and special hospices are being delivered through city and district level planning requirements [81] according to Chinese cultural traditions, a family based caring system remains a major social strand of modern Chinese society [82]. As the proportion of elderly population continues to grow [81], supportive and complementary caring facilities for this ageing populations are being encouraged through the development neighborhood–level social welfare practices [83,84]. The spatial component is to deliver special nursing rooms, day care centers and activity centers within the development boundaries of local neighborhoods. This provision is, as yet, suggestive rather than being a compulsory deliverable in the current neighborhood design, approval and implementation processes [80]. So in practice the provision of social welfare is still predominantly combined with other forms of health or cultural facilities as part of the neighborhood service center [81]. Another amenity, which garnered a significant level of dissatisfaction in the whole study area, but was most acute in small-scale high-density neighborhoods, was in relation to the lack of car parking spaces within the confines of each gated neighborhood. This is exacerbated by the shortage of urban space combined with the rapid and dramatic increase in car ownership. Insufficient attention has been paid to this shortage, which has become a common concern across all Chinese cities [85]. Solutions to the shortage of parking spaces may, from a planning perspective, need to be based on a higher-level planning intervention rather than that of the neighborhood level. Taking the parking spaces as an example, an objective assessment outcome is consistent with the subjective satisfaction results (Table 10), with the lowest rates of provision being associated with lowest rates of dissatisfaction.

Table 10. Comparing the objective parking spaces with subjective satisfaction across the five types of neighborhoods.

	Parking Space per Household	Mean of Subjective Satisfaction
LSMD	0.569	2.70
MSHD	0.619	2.98
MSMD	0.537	2.61
MSLD	0.425	2.2
SSHD	0.448	1.88

The small-scale high-density neighborhoods (SSHD) often reported significantly lower social satisfaction levels compared with the other neighborhoods, especially in the items of welfare, sports facilities, public space and parking spaces. The outcome visibly represents an increasing inequity in service provision at the neighborhood scale. From a planning perspective, an uneven allocation of facilities in, and between neighborhoods, has occurred within China's urban development practices. In practice, certain facilities and amenities are planned, and delivered, at a large scale for a block of discrete neighborhoods. These include educational and commercial facilities, where a spatially open and accessible attribute for all is crucial. Other amenities, such as sports facilities and

playgrounds, public and green spaces are incorporated into neighborhood planning and design [80]. This represents a new trend in privatization of public facilities in association with the development of gated neighborhoods.

6. Discussions and Conclusions

6.1. Public–Private Boundaries in the Provision of Neighborhood Amenities

Based on the levels of social satisfaction, a clear distinction occurs between public and private provisions, which in turn reflects local planning practices. In general terms, the levels of satisfaction with educational, commercial, health and cultural facilities were all fairly strong with limited variation between different neighborhoods. Clearly, all these have important public attributes, which are all reflected in strong spatial regulatory requirements with years of continuous planning delivery by higher level bodies [75,78]. However, the other five assessments areas, public spaces, green space, parking spaces as well as welfare and sports facilities can be characterized by variations in both neighborhood provision and neighborhood satisfaction with such provision. Neighborhood public space, green space, parking spaces as well as welfare and sports facilities, that used to be delivered and managed publicly before the 2000s, are now being delivered at neighborhood-level as a private internal product that relies heavily on individual developers. However, the adequate development of such amenities inside neighborhoods requires extra space and financial input that may reduce the cash return of developers. Furthermore, the scale and density of these gated urban neighborhoods also seem to have significant impacts on residential satisfactions. Normally the level of dissatisfaction with the provision of amenities increases with smaller scale higher density neighborhoods, which is also a form that can maximize developer's interests and profits.

There has been a strong emphasis on the configuration of many public facilities through Shenzhen's local statutory planning and these block-based public facilities have largely been delivered, much to the satisfaction of most residents. By contrast, there are significant variations in spaces and facilities provided by the private sector to those living in the newly developed small neighborhoods. As the gated form of neighborhood development has gathered pace, it appears that the internal shared spaces seem to have been neglected by the planning system, particularly for those residents living in the smallest neighborhoods where the lack of certain services and amenities seems most acute. The lack of a trustable public-private partnership may be a problem for neighborhood development. Besides providing housing itself, a developer may be required to provide physically accessible shared or communal amenity spaces and facilities, which should normally, as a minimum include sufficient parking spaces, as well as green and landscaped areas suitable for outdoor community leisure and recreational activities [86]. Many are not fully implemented in small neighborhood developments. These factors are not rigidly prescribed, but rather individually negotiated between the developer and the local planning bureau. These issues are beyond the scope of the current planning system, despite their importance in helping to deliver a decent neighborhood atmosphere [87]. Without clearer guidance and control, the fragmented nature of private sector led neighborhood cannot necessarily create the livability of neighborhoods and as we have demonstrated, varied residential satisfaction between neighborhoods can occur.

6.2. Conflicts Inside the Urban Planning System

As discussed previously, the planning and provision of urban amenities are being challenged by the fragmentation and privatization of urban space. However, present research has inadequate discussions on how the quality of life in the gated neighborhood has been removed from planning policies in the torrent of private-sector dominated urban development. An omission we discovered is a lack of concern for people's everyday life, at least to a certain extent. From the perspective of the organization of public facilities, a significant issue that is insufficiently addressed in previous studies is the current focus of the Chinese planning system. In terms of managing facilities, the system becomes

rigid with poor adaptability and is incapable of addressing many challenges in satisfying residents' real needs. Whilst there is generally positive satisfaction articulated with amenities and the balance of spatial resources at the urban block level, at the neighborhood level, greater variation in the levels of residential satisfaction and inequitable provision of service could be observed. The current planning mechanisms, with its traditional top-down approaches [88,89], may have achieved a fair degree of social equity at an upper level, usually within idealized planning units, but it has not been able to achieve similar equitable outcomes when transferred and delivered to the lowest neighborhood level. This lack of attention to the needs of the inhabitants at the neighborhood level is a weakness of the system. The top-down nature of planning means that proposals towards a sustainable form of urban development has only recently been issued at the higher levels of strategic planning, and often issued as vague policy pronouncements [90,91]. However, the real operation and implementation of these proposals in Chinese cities have met with great resistance at lowest levels of the planning hierarchy as the practiced relationships between the public and private sectors are so well intricate and entrenched. To achieve real urban sustainability, with more equitable service and amenity provision, greater efforts at the neighborhood scale are necessary and important (Figure 5).

Local government's means of configuring space that is also associated with raising revenues from its land assets and are facing increasing challenges, especially during the early stage of urban development. The division of smaller sites for neighborhood development and applying higher density can increase the land revenue of local governments and improve the cash flow and profits of small developers. They, however, may reduce the sufficiency of amenities under such intensified development. This in part explains why there are great spatial variations in local neighborhood development, whereby small-scale high-density developments tend to result in less sustainable residential patterns, both in terms of actual amenity provision and relative residential satisfaction. However, the planning regulation should contain more controls on development and should not allow the developer to place potential social burdens on the residents by decreasing the regulations on environmental design and amenity provision. The regulations for neighborhood development could be more synchronized with the controls of urban blocks and plots at the higher levels.

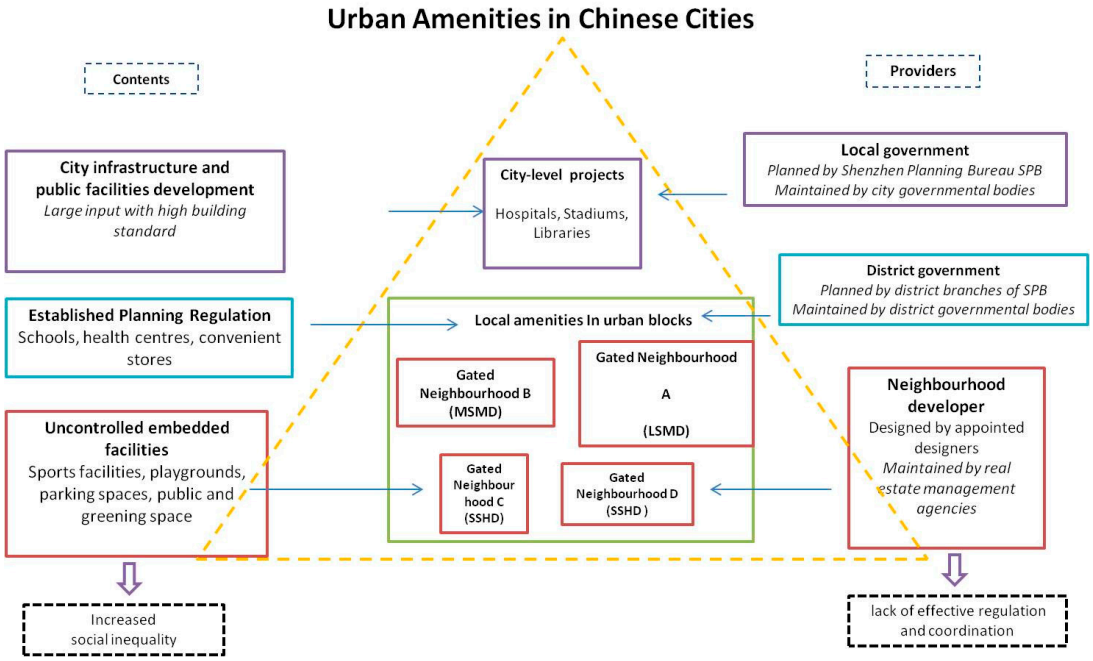

Figure 5. The hierarchical mechanism for the planning and development of urban amenities in Chinese cities and the gap at neighborhood level.

6.3. Concluding Comments

The global spread of Neoliberalism that largely emphasizes the role of private developers has often restricted public authorities from organizing urban growth. Gated neighborhood also brings new tensions between open and private realms. These features are all evident in many cities in the world, such as Budapest [29], Istanbul [18] and Kuala Lumpur [22]. With similar outcomes to those found in this study, we argue that Chinese cities are now following these trends. Regardless of the spatial, cultural and institutional divergences in different countries, neighborhood-level practice is always a bridge linking the individual or lowest units in society with the complex upper structures of cities and states, through which comprehensive judgements on the effectiveness of means of planning can be made. Worldwide researchers have proposed integrated arrangements for the delivery of public goods to reduce the segregation and inequality [2,30]. Within this context, good public-private partnership becomes increasingly important in the process of urban planning and neighborhood development. In this study, we discover a neglected socio-spatial nexus in Chinese residential environments. The birth of gated neighborhood in China is associated with a rising distinguish public–private boundary and a changing provision of urban amenities and public services. The case study in Shenzhen reveals that access to, and satisfaction with, neighborhood amenities varies greatly among different development patterns. Although the current planning system has been reasonably successful in providing equitably balanced and accessible range of amenities at the urban district and urban block levels, at the neighborhood level clear discrepancies emerge both in the provision of amenities within neighborhoods and residential subjective satisfaction with such provision. This is due to the significant imbalances in the spatial characteristics of neighborhood spaces and the consequential varied abilities to provide amenities and services. The provision of amenities in many small-scale high-density neighborhoods is often insufficient when it significantly relies on private developers who are usually small and profit-orientated. This has thus weakened the planning interventions at neighborhood level and consequently, overlooked the real demands of residents. Moreover, the enlarging inequality in urban space brings new challenges. From a city scale, we argued that urban privatization can not only accelerate the fragmentation of urban space and segregation of communities but also cause inequity problems regarding the access to facilities and service. As a result, a special concern for the internal space of gated neighborhoods is still necessary in planning practices, and efforts of promoting residential satisfaction will, in turn, ensure greater social justice. To move forward, counterpart plans for improving the imbalanced provisions of facilities are required; a more collaborative approach to better integrate and share urban resources will be indispensable. This also requires a new type of public-private partnership in building and managing facilities. Intervention could both consider planning more amenities at urban block level, especially for the certain types of facilities and spaces that are in great inadequacies with an open access for local residents as well as encouraging cross-boundary collaborations between gated neighborhoods.

7. Research Limitations

The empirical study result is based on a centrally located, middle-class based gated environment paradigm, as can be observed from its physical patterns and demographic features. However, the socio-spatial features of neighborhood and level of urban development in the outskirt areas of the city could be different. This is due to the imbalanced urban development and its uneven social structure, for example, a higher proportion of migrant populations reside in the outer districts. This restricts the case study's generalizability. Hence, this study in Nanshan, Shenzhen is a typical case representing many inner districts of large Chinese cities. Future studies could consider comparing the residential experiences (especially the use of neighborhood amenities) between gated and non-gated environments in China, though the later has become a minority pattern after the vast urban transformation.

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